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THE IMPACT OF CAPITAL ADEQUACY REQUIREMENTS ON PROFITABILITY OF PRIVATE BANKS IN INDIA (A CASE STUDY OF J&K, ICICI, HDFC AND YES BANK)

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ABSTRACT

Basel accord requires banking institutions to have capital adequacy ratio maintained at 8 percent on regular basis. The funds kept as per the ratio aims at safer functioning of banks, in view of unexpected losses, consequently amounts to huge figure fetching steady income because of investment with RBI and other government securities. Since the required deposit with the regulator checks the growing advance policy of institutions, consequently it may have its impact on the profitability margins of the banks. The aim of the study is to quantify the impact and simultaneously, the result is corroborating with the hypothesis that there is no significant impact of capital adequacy, non interest income and net interest income on profitability of the private commercial banks. Various financial ratios employed along with multiple regression suggest that the null hypothesis stand committed.

KEYWORDS

Capital Adequacy, Cost Income Ratio, Return on Assets, Spread.

INTRODUCTION

In an effort to prompt efficiency in the banking industry and after a period of worldwide liberalization and deregulation, the Basel Capital Accord Basel I which led to the endorsement of new capital adequacy frame work, Basel II marked the beginning of a new phase of re-regulation with an attempt to bring about an international harmonization of banking regulations (Bichsel and blum, 2005). Liberalization has pushed banks into new areas of competition. The banks are presently encountered with omni present factor of various types of financial and non-financial risk in every kind of activity that they undertake. If handled properly, they result as an opportunity for bankers. Risk management has thus become part and parcel of the strategic planning process of bankers. Business grows mainly by taking risk as greater the risk, higher the profit and hence the entity must strike a trade-off between the two. Risk is the potentiality that both the expected and unexpected events may have an adverse impact on the bank's capital and earnings. While the expected losses are generally taken care of by suitable pricing methodology, the unexpected losses, both on account of individual exposure and the whole portfolio in entirety, is to be borne by the bank itself and hence is to be taken care of by the requisite capital. Hence the need for suitable capital structure and sufficient Capital Adequacy requirements is felt (Raghavan, 2004). Capital is essential and critical to the perpetual continuity of a bank as a going concern. A minimum amount of capital is required to ensure safety and soundness of the bank and also to build trust and confidence of the customers. A bank with a sound capital position is able to pursue business opportunities more effectively and has more time and flexibility to deal with problems arising from unexpected losses thus achieving increased profitability (Athanasoglou et al., 2005). A Study by Hassan (2001) examined the performance of Islamic banks' worldwide during 1994-2001. Variety of internal and external banking characteristics were used to predict profitability and the result indicated high capital lead to high profitability. Abreu (2002) found that well capitalized banks face lower expected bankruptcy costs and thus lower funding costs and this resulted into better profitability. Stiroh (2002) assessed the potential benefits from the diversification of activities and increasing reliance on non-interest income. The result suggested that non interest income, particularly, trading revenue, is associated with higher risk and lower risk-adjusted profits. The results also showed few obvious diversification benefits from ongoing shift toward non interest income.

REVIEW OF LITERATURE

In assessing banks efficiency, the level, nature and composition of capital and the profitability ratios are some of the key measures used (Bourke, 1989, Berger, 1995; Thompson et al., 2002; Navapan and Tripe, 2003; Hess and Francis, 2004; Welch, 2006; Giokas, 2007). Kwan and Eisenbeis (1995) and Hughes and Mooon (1995) argued that it is necessary to recognize explicitly the concept of efficiency in the empirical models linking bank capital to risk and distinguish between efficient and inefficient risk undertaking.

Capital adequacy has been the focus of many studies and regulator as it is considered to be one of the main drivers of any financial institution's profitability (Bourke, 1989; Berger, 1995; Thompson et al.., 2002; Navapan and Tripe, 2003; White and Morrison, 2001). In contrast, other studies argue that in a world of perfect financial markets, capital structure and hence capital regulation is irrelevant (Modigliani and Miller, 1958). However, White and Morrison (2001) posited that the regulator ensures that banks have enough of their own capital at stake. Bichsel and Blum (2005) supported this proposition arguing that these regulations help in reducing negative externalities (e.g., disruptions to the payments system and a general loss of confidence in the banking system) in addition to boosting the slow economic growth hence the Gross Domestic Product (GDP). These propositions leads to the question: what then do prudential capital requirements accomplish in the banking sector? This study suggests that these requirements have something to do with a bank's performance.

Capital (equity and long-term debt) represents a source of funds to the bank along with deposits and borrowings. Pringle (1971) observed that an undercapitalized bank will find itself subjected to high levels of short-term borrowing at potentially high excess costs during periods of tight money. Flamini et al. (2009) postulated that bank returns are affected by macroeconomic variables, suggesting that macroeconomic policies that promote low inflation and stable output growth do boost credit expansion.

According to Christian et al. (2008), capital adequacy measures provide significant information regarding a firm's returns, while a few of the individual variables representing asset quality and earnings are informative. Size and growth and loan exposure measures do not appear to have any significant explanatory power when examining returns. The study establishes that the change in total assets is also significant. Thus the present study has included these variables in its model to examine the relationship between capital adequacy, cost income ratio and profitability.

Navapan and Tripe (2003) asserted that the proposition that there should be a negative relationship between a bank's ratio of capital to assets and its return on equity may seem to be self-evident as to not need empirical verification. It is therefore important to note that Berger (1995) found evidence for a positive relationship that is, the ratios of capital to assets and returns on equity were positively related. He argued that a higher capital ratio (with reduced risk of bankruptcy) should reduce a bank's cost of funds, both by reducing the price of funds and the quantity of funds required, thus improving a bank's net interest income and hence profitability.

In measuring the profitability of a bank, bank regulators and analysts have used Return On Assets (ROA) and return on equity (ROE) to assess industry performance and forecast trends in market structure as inputs in statistical models to predict bank failures and mergers and for a variety of other purposes where a measure of profitability is desired (Gilbert and Wheelock, 2007; Mostafa, 2007; Christian et al., 2008).

Jiang et al., (2003) attempted to quantify factors affecting the profitability of banks in Hong Kong. The study found that pressures on bank profitability from their more traditional business have intensified, causing them to diversify into non-interest income generating business to remain competitive. The Study also found

that equity capital ratio was not significantly related to bank profitability. Goddard (2004) investigated profitability of Euro peon banks using cross sectional data during 1990s. The results showed the relationship between the capital-asset ratio and profitability is positive. Another study, Haron (2004) measured the impact of some of the determinants of profitability. The factors such as liquidity, deposit items, asset structure, inflation and money supply had a significant long term impact on profitability. Athanasoglou (2005) examined the effect of bank specific, industry specific and macroeconomic determinants of bank profitability. The coefficient of capital variable was positive and highly significant, reflecting the sound financial condition of Greek banks. Kosmidou et al., (2005) investigated the impact of banks characteristics, macroeconomic conditions and financial market structure on banks' net interest margin and return on average assets (ROAA) in the UK commercial banking industry over the period 1995-2002. The results showed that capital strength was one of main determinants of UK banks performance providing support to the argument that well capitalized banks face lower cost of going bankrupt, which reduces their cost of funding or that they have lower needs for external funding which results in higher profitability. Ngo (2006) investigated the relationship between bank capital and profitability. The results showed no significant relationship between capital and profitability. Naceur (2006) studied the effects of capital regulations on cost of intermediation and profitability. Capital adequacy ratio contributed positively to banks' profitability. The results supported that capital regulations improved the performance of banking sector in Egypt. Moving in the same direction, a study on the scheduled commercial banks in India has been carried out in the present work.

METHODOLOGY

Navapan and Tripe (2003) found the contrary - that is, negative relationship between capital and profitability exists. Ghosh et al. (2003) explained that banks are required to hold capital equal to a certain percentage of the total risk-weighted assets. Under the risk-based standards, capital consists of three parts: Tier-I Capital includes equity capital and free reserves. Tier-II Capital comprises of subordinate term debt of 5-7 years tenure, revaluation reserves, general provisions and loss reserves, hybrid (debt/equity) capital instruments and undisclosed reserves and cumulative perpetual preference shares. Tier-III Capital comprises of short-term subordinate debt. Using the expected bankruptcy theory, Lewis (2008) explained that the expected bankruptcy costs hypothesis can be used to explain part of the observed positive relationship between capital asset ratios (CARs) and return on assets (ROA) under certain circumstances. This reasoning forms the basis for the first set of testable hypotheses as follows:

HYPOTHESIS

H: There is no significant impact of Capital to Risk Weighted Assets Ratio, Non Interest Income and Net Interest Margin on Profitability of Private Sector Banks.

OBJECTIVES OF THE STUDY

The study investigates the impact of capital adequacy norms on performance of private commercial banks (excluding public sector, Foreign Banks and regional rural banks). The study also compares the performance measured in terms of Return on Assets (ROA) of different Private Sector Banks in India.

SCOPE OF THE STUDY

The Study has been carried out on Private Commercial Banks in India (excluding Public, Foreign and Regional Rural Banks).

DATA SOURCE

Data has been collected from "Statistical Tables Relating to Banks in India" and "Report on Trend and Progress of Banking in India" Published by Reserve Bank of India for the Years 1996-97 to 2006-07 and available on www.rbi.org.in.

MODEL FRAMEWORK

CAPITAL ADEQUACY AND PROFITABILITY MODEL	
C- Capital Adequacy	- Capital Adequacy Ratio
	- Debt-Equity Ratio
	- Advances to Assets
	- G-Secs to Total Investments
	- Spread to Total Assets
	- Net Profit to Average Assets
E- Earning Quality	- Interest Income to Total Income
	- Non-Interest Income to Total Income
	- Earnings per Share
	- Return on Assets
	- Profit Margin Ratio
	- Burden to Total Income

DESCRIPTION OF VARIABLES

CAPITAL ADEQUACY

Capital Adequacy is important for a bank to maintain depositors' confidence and preventing the bank from going bankrupt. Capital is seen as a cushion to protect depositors and promote the stability and efficiency of financial system around the world. Capital Adequacy reflects the overall financial condition of the banks and also the ability of the management to meet the need for additional capital. It also indicates whether the bank has enough capital to absorb unexpected losses. Capital Adequacy ratios act as indicators of banks' leverage.

(i) Capital to Risk Weighted Assets Ratio (CRAR): In India, as per Basel norms issued in April, 1992all Scheduled commercial banks were required to maintain a CRAR of 8% w.e.f 31-03-1995 (9%from 31-03-2000); otherwise the bank will be treated as undercapitalized.

CRAR = Capital/Risk Weighted Assets

Higher the CRAR, lower the need to external funding and therefore higher profitability. It is also seen that well capitalized banks face lower costs of going bankrupt and then cost of funding is reduced.

Berger (1995) and Dermerguc-Kunt and Huizingua (1999) find a positive relationship between Bank Performance and Capitalization. Naceur (2003) find a positive relationship between ROA and Capital. The results indicate that well capitalized banks support lower expected bankruptcy costs for themselves and their customer, which reduce their cost of capital. A bank with a sound capital position is able to pursue business opportunities more effectively and has more time and flexibility to deal with problems arising from unexpected losses thus achieving increased profitability (Athanasoglou *et al.* 2005)

(ii) Debt-Equity Ratio: This ratio indicates the degree of leverage of a bank. It indicates how much of the bank business is financed through debt and how much is financed through equity. It is arrived by dividing total borrowing and shareholders net worth which includes equity capital and Reserves & Surplus. It indicates how much times are debt to equity. Higher ratio indicates less protection for the creditors and depositors of the bank.

(iii) Advances to Assets Ratio: This ratio shows the aggressiveness of bank in lending funds which ultimately results in better profitability. This ratio is arrived at by dividing Advances by Assets. It indicates how much proportion or percentage of Total Assets is utilized in the form of Advances. Higher ratio means that there are more advances as the proportion of total assets. Advancing being the core function of banks so higher ratio of Advances/Assets is preferred to a lower one.

(iv) Government Securities to Total Investments: The percentage of investment in Government Securities is a very important indicator which shows the risk taking ability of a bank. It indicates a bank's strategy as being High Profit-High Risk or Low Profit-Low Risk. It also gives view as to the availability of alternative investment opportunities. Government securities are generally considered as the most safe debt instrument, which as a result carries the lowest return. Since Government securities are risk free, the higher the Government Securities to Total Investments ratio, the lower the risk involved in a bank's investments. This ratio is calculated as:

Investment in Govt. Securities / Total Investment

EARNING QUALITY & PROFITABILITY

The quality of earnings is very important criterion which determines the ability of a bank to earn consistently. It basically determines the profitability of the banks. It also explains the sustainability and growth in earnings in the future. This parameter has gained importance in the light of the argument that much of a bank's income is earned through activities like investments, treasury operations, corporate advisory services and so on.

(i) Spread to Total Assets: It creates a wedge between returns to savers and investors and reflects the cost of bank intermediation services and the efficiency of the banking sector. In general, the higher the net interest margin, the higher are banks profit margins and more stable is the banking sector. However, a higher net interest margin could reflect riskier lending practices associated with substantial loan loss provisions and could be an indication of inefficiency in the banking sector (Jiang, 2003)

The difference between the total income and the total expenses of a bank gives taxable income. However, considering the intermediation function, it is the Net Interest Income (NII = Interest earned – Interest expended) that is more crucial for banks. For the long term sustenance of the bank, this should be positive. The deregulated interest rate environment, the pressure built by competition for attracting deposits, liberalization and other banking norms & regulations affect the interest rates and thereby Net Interest Income (NII).

This ratio shows the ability of a bank to keep the interest on deposits low and interest on advances high. It is an important measure of a bank's core income (income from lending operations). A higher spread indicates the better earnings, given the total assets. This ratio is calculated as:

Spread to Total Assets = Spread / Total Assets

(Where Spread = Interest earned - Interest expended)

(ii) Net Profit to Total Assets: This ratio measures the net profit as a percentage of total assets employed in business. Higher ratio indicates better performance and profitability and lower ratio indicates inefficient and incompetent performance.

Net profit to Total Assets = Net Profit / Total Assets

(iii) Interest Income to Total Income: Interest Income is a basic source of revenue for banks. The Interest Income to Total Income Ratio indicates the ability of the bank in generating income from its lending activities. In other words, this ratio measures the income from lending operations as a percentage of the total income generated by bank in a year. Interest Income includes Interest on Advances, Discount on Bills, Income from Investments, Interest on Deposits with RBI and Other Inter-Bank Funds.

Interest Income to Total Income = Interest Income/Total Income

(iv) Non-Interest Income to Total Income investments, net Profit on sale of land, building and other assets and net profit (loss) on exchange transaction and other miscellaneous incomes etc.

In recent years the pressures on bank profitability from their more traditional lending business have intensified, causing them to diversify into non-interest income generating business to remain competitive (Jiang, 2003)

Ratio of Non-Interest Income to Total Income = Non-Interest Income/Total Income x 100

(v) Earnings per Share: This ratio measures the profitability of the firm on per Equity Share basis. This ratio measures the earnings available to an equity shareholder on a per share basis.

(vi) Return on Assets: The performance of banks is measured through Return on Assets (ROA). It reflects the ability of the bank to generate profit from the bank's assets (Naceur, 2006). ROA emerges as the key ratio for the evaluation of bank profitability (IMF, 2002).ROA is defined as the net profit divided by total assets. ROA measures the ability of the management to convert the assets of the bank into net earnings. (Sarkar et al., 1998)

ROA = Net Profit / Total Assets

(vii) Profit Margin Ratio: The profit margin of a company determines its ability to withstand competition and adverse conditions like rising costs, falling prices or declining sales in future. This ratio measures the percentage of net profit to total income and thus is a measure of efficiency of the company.

PMR = Net Profit / Total Income

(viii) Burden to Total Income: The Burden analysis reveals as to what extent the bank is in a position to cover the non-interest expenditure through non-interest income. If a bank is able to cover the non-interest expenses with the help of non-interest income the bank is said to have fine performance and as such have no burden on interest income on account of non-interest expenditure. Burden denotes a bank's ability to earn from non-conventional sources. In a liberalized environment this ratio assumes greater significance. With the building of pressure on interest income, banks are now trying to increase their non-fund based income also.

Burden to Total Income = Burden / Total Income

(Where Burden = Non-Interest Expenses – Non-Interest Income)

The period for evaluating impact of capital adequacy requirements on profitability of private banks in this study ranges from 2004-05 - 2008-09 i.e. for 5 years. The data is collected from various sources such as Annual Reports of the Banks, Indian Banking Association Journal, Reserve Bank of India (RBI) Bulletin, Journal of Banking Studies, Journal of Accounting and Finance and Indian Journal of Commerce. Internet has been an important source of secondary data. The site assessed for this research is www.rbi.org.in. In order to have a comprehensive view, the growth of each ratio covered by capital adequacy and profitability ratios are calculated. Moreover, multiple regression is being employed to measure the degree of impact of capital adequacy requirements on profitability of banks under study. Mean of profitability ratios is taken as dependent variable and various capital adequacy ratios taken as independent variable. If there are n independent variables, we call them x1, x2, x3 and so on up to xn. Multiple regression then finds values of a, b1, b2, b3 and so on up to bn which give the best fitting equation of the form

$$y = a + b1x1 + b2x2 + b3x3 + ... + bnxn$$

b1 is called the coefficient of x1, b2 is the coefficient of x2, and so forth. The equation is exactly like the one for simple regression, except that it is very laborious to work out the values of a, b1 etc by hand. Minitab, however, does it with exactly the same command as for simple regression. The equation of multiple regression by using the various required variables is:

$$PR(Y) = \alpha_0 + \alpha_1(\text{CRAR}) + \alpha_2(\text{DER}) + \alpha_3(\text{AAR}) + \alpha_4(\text{GSTI}) + \in$$

What do the regression coefficients mean? The coefficient of each independent variable tells us what relation that variable has with y, the dependent variable, with all the other independent variables held constant. So, if b1 is high and positive, that means that if x2, x3 and so on up to xn do not change, then increases in x1 will correspond to large increases in y.

GOODNESS OF FIT IN MULTIPLE REGRESSION

In multiple regression, as in simple regression, we can work out a value for R2. However, every time we add another independent variable, we necessarily increase the value of R2 (you can get an idea of why this happens if you compare one with another in the handout on "The idea of a regression equation"). Therefore, in assessing the goodness of fit of a regression equation, we usually work in terms of a slightly different statistic, called R2or R2adj.

This is calculated as

R2adj = 1 - (1-R2)(N-n-1)/N-1)

Where

N is the number of observations in the data set (usually the number of people) and n the number of independent variables or regressors. This allows for the extra regressors. Check that you can see from the formula that R2adj will always be lower than R2 if there is more than one regressor.

RESULTS AND DISCUSSION

CAPITAL ADEQUACY

Capital adequacy is important for a bank to maintain depositors' confidence and preventing the bank from going bankrupt. Capital is seen as a cushion to protect depositors and promote the stability and efficiency of financial system around the world. Capital Adequacy reflects the overall financial condition of the banks and also the ability of the management to meet the need for additional capital. It also indicates whether the bank has enough capital to absorb unexpected losses. Capital Adequacy Ratios acts as indicators of bank leverage. Higher CRAR reveals lower Credit Risk of the banks. If the banks have more risky assets on its portfolio, then the capital will be lower implying greater Credit Risk Exposure. The higher the CRAR, the stronger is considered a bank as it ensures high safety against bankruptcy. This shows that the private sector banks under study have maintained higher capital adequacy ratio higher than the prescribed level. According to the norms of RBI, each bank in India has to maintain 9 percent of their risk-weighted assets as capital with effect from March 2009. The Debt-Equity ratio indicates the degree of leverage of a bank. It indicates how much of the bank business is financed through debt and how much through equity. This ratio witnessed an increasing trend in case of banks under study except ICICI Bank. This indicates that the dependence on debt capital has increased over the period of study in case of all the three banks except ICICI Bank.

TABLE 1.1: CAPITAL ADEQUACY RATIOS OF PRIVATE SECTOR BANKS (FIGURES IN PERCENT)

Banks \ Years		2004-05	2005-06	2006-07	2007-08	2008-09
J&K Bank	1	15.15	12.14	13.24	12.80	13.46
	2	13.66	13.70	13.26	13.18	13.37
	3	47.15	54.75	59.62	57.64	55.52
	4	64.05	70.54	74.82	79.20	70.84
ICICI Bank	1	11.78	13.35	11.69	14.92	15.92
	2	11.99	10.14	12.97	7.54	6.60
	3	54.51	56.36	56.82	56.43	57.55
	4	68.31	64.11	74.14	67.75	61.59
HDFC Bank	1	12.16	11.41	13.08	13.60	15.09
	2	10.38	12.87	13.18	10.51	11.11
	3	49.71	47.70	51.45	47.62	53.99
	4	58.02	69.14	73.76	64.24	88.82
YES Bank	1	18.81	16.43	13.6	13.6	16.6
	2	4.89	6.27	13.11	11.87	13.10
	3	59.53	57.83	56.64	55.53	54.16
	4	68.05	60.14	70.04	70.60	65.76

Source: *- Compiled from the Annual Reports of Banks, Performance Highlights of Indian Banks (published by IBA) and CMIE Prowess.*

Note:

1. Capital Adequacy Ratio (CRAR).
2. Debt-Equity Ratio.
3. Advances to Assets.
4. G-securities to Total Investments.

The ratio Total Advances to Total Assets indicates a bank's aggressiveness in lending which ultimately results in better profitability. Higher ratio of advances/deposits (assets) is preferred to a lower one. This ratio has witnessed an increasing trend in case of all the four private sector banks over the period of study. The aggressive lending policy of private banks is one of the reasons for the better profitability of the banks. The ratio G-Secs to Total Investments: The percentage of investment in government securities to total investments is a very important indicator, which shows the risk-taking ability of the bank. It indicates a bank's strategy as being high profit- high risk or low profits-low risk. It also gives a view as to the availability of alternative investment opportunities. Government Securities are generally considered as the most safe debt instrument, which as a result carries the lowest return. Since government securities are risk free, the higher the G-Secs to investment ratio, the lower the risk involved in a bank's investments. This ratio has witnessed an decreasing trend in case of all private sector banks except J&K Bank over the period of study. From the above analysis we conclude that the banks under study have succeeded in maintaining CRAR at a higher level than the prescribed level, the higher CRAR of all the banks reveal that the Credit Risk Exposures of the selected banks are low and these banks are adopting a more conservative approach in monitoring their asset portfolio. But they cannot take a more aggressive risk profile towards credit as the CRAR during the period of study is not very much higher than the minimum prescribed level by RBI and the dependence on the debt capital has decreased over the last five years in case of all the banks under study.

EARNING ANALYSIS

In the earning perspective, the focus of analysis is the impact of changes in interest rates on accrual or reported earnings. This is the most used approach to interest rate risk assessment taken by many banks. Variation in earnings is an important focal point for interest rate analysis because reduced earnings or outright losses can threaten the spread insulation and financial stability of an institution by undermining its capital adequacy and by reducing its market confidence.

In this context, spread analysis (i.e. difference between interest earnings interest earnings and interest expended has received more attention in banking crises because it directly and easily develop link to change interest rates). In addition, to burden and profitability analysis also focuses on impact of capital adequacy on bank profitability. As the Non-Interest Expenses comprise Operating Expenses of the bank and the provision and contingencies created by the bank, the increase in the ratio is the result of any of these components. Apart from Interest Income, the banks have certain other income in the form of fees, commission, exchange etc. The Non- Interest of the banks should be sufficient to meet the Non-Interest Expenses; otherwise it would become a burden for the banks. Here the ratio indicates as to what extent the Non-Interest Expenses can be covered by the Non-Interest Income. The proportion of Non-Interest Income to Non-interest Expenses of the banks under study is showing a decrease during the period of study.

TABLE 1.2: EARNING QUALITY & PROFITABILITY OF PRIVATE SECTOR BANKS (FIGURES IN PERCENT)

Years / Banks		2004-05	2005-06	2006-07	2007-08	2008-09
J&K Bank	1	2.43	2.51	2.68	2.47	2.65
	2	0.47	0.66	0.96	1.10	1.08
	3	94.16	92.76	92.22	90.85	92.42
	4	5.84	7.24	7.78	9.15	7.58
	5	23.74	36.48	56.62	74.27	84.54
	6	0.47	0.67	0.96	1.09	1.09
	7	7.05	9.61	13.33	13.44	12.67
	8	1.96	1.84	1.72	1.37	1.57
ICICI Bank	1	1.69	1.87	1.19	1.83	2.20
	2	1.19	1.01	0.90	1.04	0.99
	3	73.36	77.38	79.50	77.75	80.35
	4	26.64	26.62	20.50	22.25	19.65
	5	27.55	32.49	34.84	39.39	33.76
	6	1.59	1.30	1.09	1.12	0.98
	7	15.63	13.74	10.75	10.50	9.71
	8	0.50	0.86	1.02	0.79	1.21
HDFC Bank	1	3.46	3.46	4.06	3.92	4.04
	2	1.29	1.18	1.25	1.19	1.23
	3	82.61	79.93	81.96	80.99	82.60
	4	17.39	20.07	18.04	19.01	17.40
	5	22.92	27.92	36.29	46.22	52.85
	6	1.47	1.38	1.33	1.32	1.28
	7	17.77	15.55	13.58	12.82	11.44
	8	2.16	2.28	2.81	2.73	2.81
YES Bank	1	1.41	2.12	1.54	1.95	2.23
	2	-0.29	1.33	0.85	1.18	1.33
	3	62.26	65.60	75.12	78.71	82.16
	4	37.74	34.40	24.88	21.29	17.84
	5	-0.24	2.20	3.46	7.02	10.24
	6	-0.29	2.13	1.44	1.54	1.60
	7	-7.81	19.08	12.06	12.01	12.46
	8	1.71	0.79	0.69	0.77	0.90

Source: *- Compiled from the Annual Reports of Banks, Performance Highlights of Indian Banks (published by IBA) and CMIE Prowess.*

Note:

1. Spread to Total Assets
2. Net Profit to Average Assets
3. Interest Income to Total Income (cost income ratio)
4. Non-Interest Income to Total Income
5. Earnings per Share
6. Return on Assets
7. Profit Margin Ratio
8. Burden to Total Income

The ratio Non-Interest Income to Average working Funds denotes a bank's ability to earn from non-conventional sources. In a liberalized environment, this ratio assumes significance. For, it mirrors a bank's ability to take full advantage of its operational freedom. Operating costs, priority sector lending, non-performing loans, investment in government securities and the composition of deposits are among the determinants of bank profitability in the Indian banking sector. Form the analysis of profitability ratios of the private sector banks under study, the profit margin ratio (defined as ratio of net profit to total income) showed an increasing trend in case of J&K and Yes bank in the period under study. The bank's profitability whether measured by return on assets (ROA) or return on equity (*CIR*). ROA has declined in case of the two banks over the period of study. However, the fall-off appears more directly related to the asset quality problems experienced by a number of large banks than to the capital adequacy requirements. When net income is adjusted to exclude the sharp run-up in loan-loss provision these years, there is much less movement and even a slight increase in both ROA and other profitability ratios.

TABLE 1.3: CAPITAL ADEQUACY RATIOS – DESCRIPTIVE STATISTICS

Ratios	Banks	Mean Ratio	Std. Dev	F - Value	Significance (Two-Tailed)
CRAR	J & K	13.358	1.121	2.70	0.080
	ICICI	13.532	1.879		
	HDFC	13.068	1.409		
	Yes	15.808	2.224		
Debt Equity ratio	J & K	13.434	0.235	2.34	0.111
	ICICI	9.848	2.752		
	HDFC	11.610	1.325		
	Yes	9.848	3.959		
Advances to Assets	J & K	54.936	4.750	5.27	0.010
	ICICI	56.334	1.124		
	HDFC	50.094	2.693		
	Yes	56.738	2.068		
G-securities to Total Investments	J & K	71.890	5.622	0.61	0.617
	ICICI	67.180	4.762		
	HDFC	70.796	11.647		
	Yes	66.918	4.239		

Table: 1.3 shows the summary statistics of the collected variables. It is obvious from the above table that the banks under study have have maintained the average Capital Adequacy Ratio at an average of 13.35%, 13.53%, 13.06 and 15.80% respectively between 2004-05 to 2008-09. This shows that banks under study have maintained higher CRAR than the prescribed level.These descriptive statistics imply that most banks are keen on ensuring further more there is no significant difference between the banks under study in case of CRAR ratio as depicted by the F-test, same is the case with debt equity and G-Securities to total investment ratios. In case of advances to assets ratios the banks under study differ significantly at a significant level of 0.010. the above statistical analysis reveal that their capital levels are above the minimum required statutory limits, average debt equity ratio is low that implies Indian private banks are credit shy and lastly there is huge investment in government securities which mean the banks are risk averse.

TABLE 1.4: EARNING AND PROFITABILITY RATIOS – DESCRIPTIVE STATISTICS

Ratios	Banks	Mean Ratio	Std. Dev	F - Value	Significance (Two-Tailed)
Spread to Total Assets	**J & K**	2.5480	0.1110	47.61	0.000
	ICICI	1.7560	0.3675		
	HDFC	3.7880	0.3042		
	Yes	1.8500	0.3595		
Net Profit to Average Assets	**J & K**	0.8540	0.2775	1.06	0.394
	ICICI	1.0260	0.1055		
	HDFC	1.2280	0.0449		
	Yes	0.8800	0.6828		
Interest Income to Total Income	**J & K**	92.482	1.186	17.00	0.000
	ICICI	77.668	2.702		
	HDFC	81.618	1.152		
	Yes	72.770	8.527		
Non-Interest Income to Total Income	**J & K**	7.518	1.186	16.72	0.000
	ICICI	23.132	3.328		
	HDFC	18.382	1.152		
	Yes	27.230	8.527		
Earnings per Share	**J & K**	55.13	25.33	10.57	0.000
	ICICI	33.61	4.27		
	HDFC	37.24	12.42		
	Yes	4.54	4.13		
Return on Assets	**J & K**	0.8560	0.2756	1.00	0.417
	ICICI	1.2160	0.2386		
	HDFC	1.3560	0.0730		
	Yes	1.2840	0.9196		
Profit Margin Ratio	**J & K**	11.220	2.805	0.61	0.617
	ICICI	12.066	2.512		
	HDFC	14.232	2.473		
	Yes	9.560	10.161		
Burden to Total Income	**J & K**	1.6920	0.2308	30.56	0.000
	ICICI	0.8760	0.2652		
	HDFC	2.5580	0.3132		
	Yes	0.9720	0.4193		

The difference between the total income and total expenses of the banks gives the pre-tax income. However, considering the intermediation function, it is the interest income (NII) that is more crucial for the banks. NII or spread is the difference the interest income and the interest expenses. Spread is the bread for the banks. For long term sustenance of the bank, this should be positive. In a deregulated interest rate environment, the market plays a critical role deciding the interest rates. In addition to the pressure built by competition for deposits and is thereby affecting the NII. The main ratio depicting potential of banks from there prime activity is spread analysis. The insulation of positive spread indicates that asset liabilities have been positively and properly managed. As revealed by the Table 1.4 there is a significant difference between banks on account of ratios like Spread to Total Assets, Interest Income to Total Income, Non-Interest Income to Total Income, Earnings per Share, Burden to Total Income as $p < .05$. In case of Net Profit to Average Assets, Return on Assets and Profit Margin Ratio there was no significant difference in burden ratios of the three banks as revealed by the F-test at 5percent significance level.

TABLE: 1.5: PEARSON TABLE FOR THE VARIABLE CORRELATIONS

		Mean Profitability Ratio	CRAR	Debt Equity Ratio	Advance to Assets Ratio
	N				
CRAR	**Pearson Correlation**	**-.498(*)**			
	Sig. (2-tailed)	**.026**			
	N	**20**			
Debt Equity Ratio	**Pearson Correlation**	**.422**	**-.665(**)**		
	Sig. (2-tailed)	**.064**	**.001**		
	N	**20**	**20**		
Advance to Assets Ratio	**Pearson Correlation**	**-.090**	**.323**	**-.348**	
	Sig. (2-tailed)	**.706**	**.165**	**.133**	
	N	**20**	**20**	**20**	
G-securities to Total Investment	**Pearson Correlation**	**.423**	**-.176**	**.402**	**.213**
	Sig. (2-tailed)	**.063**	**.457**	**.079**	**.368**
	N	**20**	**20**	**20**	**20**

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

In Table 1.5, we have the Pearson correlation Table for the variables that were included in the regression models. The results indicate that the average profitability of four Indian private sector banks are negatively correlated with the CRAR, the debt to equity ratio (DE), Advance to Asset Ratio and G- Sec. to Total Investment .The consistency of the two profitability negative correlation with Capital Adequacy is consistent with the view that the higher the Capital adequacy, the lower the profitability. Most banks strive to minimize the capital adequacy as much as possible. The other CARs are positively correlated with the two profitability measures, demonstrating a consistent view that there exists a positive relationship between capital adequacy and profitability. The higher the capital levels, the higher the profitability (Bourke, 1989; Berger, 1995).

Table 1.5 shows the Pearson product moment coefficient of correlation (also called the correlation coefficient or correlation) for pairs of variables. The correlation coefficient is a measure of the degree of linear relationship between two or more variables. The dependent variables for the study are bank profitability as measured by average of eight profitability ratios (Spread to Total Assets, Net Profit to Average Assets, Interest Income to Total Income (cost income ratio), Non-Interest Income to Total Income, Earnings per Share, Return on Assets, Profit Margin Ratio, Burden to Total Income), (defined by net income scaled by total equity) (Gilbert and Wheelock, 2007). The independent variables are: the Capital (tier 1+II+III) to risk weighted assets (leverage) (CRAR) ratio, Debt-Equity Ratio, Advances to Assets and G-securities to Total Investments. Consistent with Bichsel and Blum (2004), the debt to equity ratio will be used as a control for the bank's leverage and the ratio of total assets to total liabilities will also be used as a control variable.

In order to assess the relationship between profitability and capital adequacy ratios, the profitability is modelled as a function of the core capital ratio, the equity capital ratio, the total risk based capital and the total capital ratio Consistent with Gilbert and Wheelock (2007).

TABLE 1.6: REGRESSION ESTIMATES OF THE VARIOUS CAPITAL ADEQUACY DETERMINANTS FOR THE BANKS UNDER STUDY. THE DEPENDENT VARIABLE IS AVERAGE OF PROFITABILITY RATIO.

Model	Unstandardized Coefficients		t	Sig.
	B	Std. Error		
1(Constant)	19.556	13.429	1.456	.166
CRAR	-.730	.460	-1.588	.133
Debt Equity	-.037	.367	-.102	.920
Assets toAdvance	-.030	.199	-.149	.883
G-securities to Total Investment	.166	.113	1.478	.160

ANOVA(b)

a Predictors: (Constant), CRAR,
Debt Equity, Assets to Advance and G-securities,

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	69.983	4	17.496	2.155	.124(a)
	Residual	121.803	15	8.120		
	Total	191.786	19			

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.604(a)	.365	.196	

The table represents stacked data for the period 2004-05 to 2008-09 for the four private banks operating in India. Multiple Regression were used to test the hypotheses developed earlier.

Panel A: Regression of average profitability, capital to risk weighted assets, debt equity, assets to advances and G-Securities to total investment. The equation of multiple regression by using the various required variables is:

$$PR(Y) = \alpha_0 + \alpha_1(\text{CRAR}) + \alpha_2(\text{DER}) + \alpha_3(\text{AAR}) + \alpha_4(\text{GSTI}) + \in$$

The results reveal that a negative relationship exists at for both measures of profitability and equity capital ratio. Although these findings are not significant, they are consistent with previous studies which find that a negative relationship between bank capital and profitability exists (e.g., Navapan and Tripe, 2003). The negative relationship can be explained by the fact that the more the equity providers to a bank, the higher the claim from the bank's retained earnings in the form of dividends. This leads to less retained funds available to the bank for growth purposes, hence less funds available to boost profits.

This study adds to the existing literature such as Navapan and Tripe (2003) who found out that the expected negative relationship between capital and profitability exists. The study also adds to previous findings that there is a positive relationship between capital adequacy and profitability (Bourke, 1989; Berger, 1995). This makes economic sense from the point of view that an increase in capital may raise expected earnings by reducing the expected costs of financial distress, including bankruptcy. This means that a bank can acquire more capital to improve its more profits.

CONCLUSIONS

This study examines the relationship between bank profitability, Capital adequacy. While prior research documents that a positive or negative relation exists between CRAR and bank profits, no study has addressed the more fundamental question of whether the bank profitability measures are related to the Capital to risk weighted assets.

Using bank profitability average ratios, the study finds that bank profitability is negatively related to the CRAR. The results also suggest that in the market driven environment, the scheduled commercial banks net interest margin is under pressure and they have to look into other sources of income to maintain position in the market. In the coming years, when entry for foreign banks would become easier, the competition in the banking sector will be more intense, the existing public sector banks and Indian private sector banks can achieve a desirable and respectable ROA only when these banks will generate non-risky, non-interest income besides their regular interest income from advances and investments.

The most significant finding in this study which other similar studies have not pointed out is the fact that there are differential effects of the various measures of capital adequacy on the profitability of the bank. This study finds out that the non-risk weighted capital adequacy measure (i.e., the equity capital ratio) is negatively related with the profitability of a bank (as measured by eight profitability ratios) These findings are significant in the sense that the risk adjustment helps to account for the uncertainty associated with bank's capital levels. This acts a reliable measure of the nature and the composition of capital inherent in a bank's capital structure.

Future research could incorporate more variables such as taxation and other regulation indicators, exchange rates as well as indicators of the quality of the services offered by banks in the models used in this study. Another possible extension could be the use of dual regression models where the ROA and ROE variables are regressed at the same time with the various independent, control and dummy variables.

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